

Trunk Exercises on Stable and Unstable Surfaces

Behm D et al. Trunk Muscle Electromyographic Activity With Unstable and Unilateral Exercises, *Journal of Strength & Conditioning Research* 2005, 19(1), 193-201

Summary

The study evaluates trunk strength exercises on stable and unstable surfaces and concludes that trunk-stabilizer muscles are more highly activated by unstable rather than stable exercises.

Abstract

The purpose of this cross-sectional study was to evaluate the effect of unstable and unilateral resistance exercises on trunk muscle activation. Eleven subjects (6 men and 5 women) between 20 and 45 years of age participated.

Six trunk exercises, as well as unilateral & bilateral shoulder and chest presses against resistance, were performed on stable (bench) and unstable (Swiss ball) bases. Electromyographic activity of the upper lumbar, lumbosacral erector spinae, and lower abdominal muscles were monitored. Instability generated greater activation of the lower abdominal stabilizer musculature (27.9%) with the trunk exercises and all trunk stabilizers (37.7%-54.3%) with the chest press. There was no effect of instability on the shoulder press. Unilateral shoulder press produced greater activation of the back stabilizers, and unilateral chest press resulted in higher activation of all trunk stabilizers, when compared with bilateral presses. Regardless of stability, the superman exercise was the most effective trunk stabilizer exercise for back stabilizer activation, whereas the side bridge was the optimal exercise for lower abdominal muscle activation. Thus, the most effective means for trunk strengthening should involve back and abdominal exercises with unstable bases.

Furthermore, trunk strengthening can also occur when performing resistance exercises for the limbs, if the exercises are performed unilaterally.